



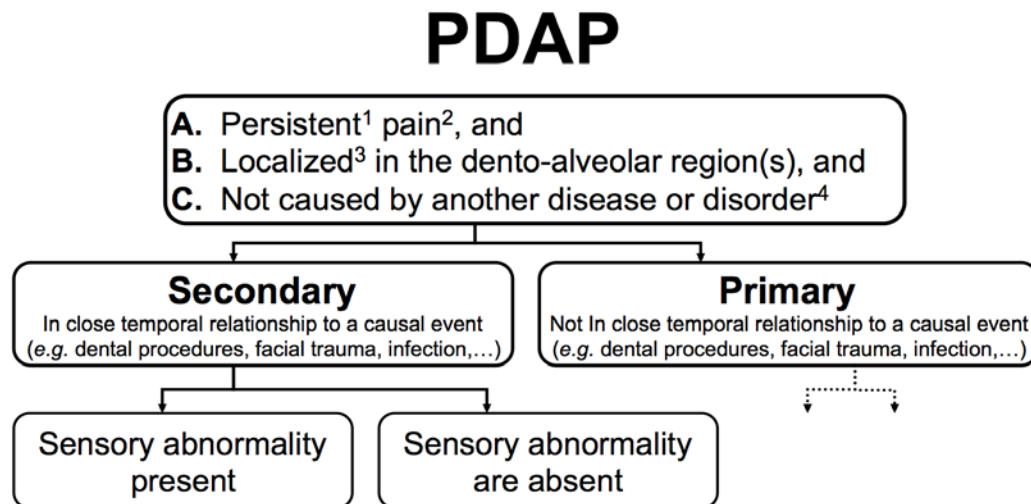
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Persistent Dento-Alveolar Pain Disorder (PDAP)

Definition

Dental professionals agree that a distinct clinical entity that manifests as a persistent (chronic) continuous pain symptom located in the dento-alveolar region and cannot be explained within the context of other diseases or disorders (Nixdorf *et al*, 2012). This entity, with ambiguity, has previously been referred to as atypical odontalgia, phantom tooth pain, and neuropathic tooth pain and as a subgroup within persistent idiopathic or atypical facial pain as well. Following a recent consensus exercise involving clinical experts and methodologists, the entity has been termed persistent dento-alveolar pain disorder (PDAP), and diagnostic criteria have been proposed (see Figure 1) (Nixdorf *et al*, 2012).

Figure 1: Diagnostic criteria for persistent dento-alveolar pain disorder (PDAP)





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Criteria

- ¹ Persistent—meaning pain present at least 8 hours/day \geq 15 days per month for \geq 3 months' duration
- ² Pain—as defined as per IASP criteria (includes dysesthesia)
- ³ Localized—meaning the maximum pain defined within an anatomical area
- ⁴ Extent of evaluation nonspecified (dental, neurological exam +/- imaging, such as intra-oral, CT and/or MRI)

Epidemiology

An accurate estimate for the prevalence of PDAP is unavailable because existing studies have used convenience sampling from clinical populations. A systematic review determined the frequency of nondental pain following root canal treatment (endodontics), which was 3.4%, thus giving an estimate of the upper limit (Nixdorf *et al*, 2010). A further review of the data available restricting its search to articles reporting information consistent with PDAP suggested a frequency of 1.6%, following dental treatment involving removal of the sensory nerve, such as extraction or root canal treatment (Nixdorf & Moana, 2011).

One paper in the literature provides data on potential risk factors for PDAP following root canal therapy identifying extended duration of preoperative pain, presence of other chronic pain problems, female gender, and a history of painful treatment in the orofacial region as statistically significant risk factors for PDAP (Polycarpou *et al*, 2005).

Pathophysiology

The mechanisms that have been proposed to be involved in PDAP are psychological or neuropathic in nature. Psychosocial factors in patients with PDAP have only been investigated using case-control studies (Jacobs *et al*, 2002; List *et al*, 2007; Takenoshita *et al*, 2010). These studies reported higher values of various measures of psychological distress in patients with PDAP, an expected observation in patients with chronic pain. Neuropathic factors in patients



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with PDAP have also only been investigated using case-control studies using psychophysical assessments (*e.g.*, Jacobs *et al*, 2002; List *et al*, 2009; Zagury *et al*, 2012; Baad-Hansen *et al*, 2013).

Using a battery of psychophysical tests, patients with PDAP have highly variable responses. Across the data available, there appears to be a tendency towards a lowered pain threshold to stimuli, as well as increased pain intensity and duration with suprathreshold stimuli. Brainstem function, via the blink reflex, demonstrated a delayed response (Baad-Hansen *et al*, 2005), and local anaesthetic block of the peripheral somatic innervation did not significantly reduce pain in half of those with PDAP (List *et al*, 2006). Given the variation, PDAP likely involves heterogeneous alterations of nerve function affecting both the peripheral and central nervous systems.

Treatment

No randomized controlled trials assessing treatment outcomes have been reported; therefore, care is based on expert opinion and empirical observations. Case-series data suggest that reduction in pain intensity with antiepileptic and tricyclic antidepressant medications taken orally has been helpful (Pigg *et al*, 2013). Reports of peripherally applied medications in the oral tissues have shown some promise (Heir *et al*, 2008), but they lack sufficient preclinical data about safety. Besides pharmacotherapy approaches to treatment, multidisciplinary management approaches to care that include health psychology treatments, such as cognitive behavioural therapy, interpersonal therapy, and autonomic regulation (*e.g.*, mindfulness, relaxation) are thought to be helpful.

Addressing comorbid mood and personality disorders, when present, are thought to be helpful given their efficacy in other chronic pain conditions. This extends to temporomandibular disorders (TMD), which are comorbid with PDAP in half of patients (List *et al*, 2007). Also, avoidance of invasive and irreversible treatments that involve local tissue injury (*i.e.*, root canal



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treatment, tooth extraction, implant placement) is recommended because repeated application of such dental procedures is thought to perpetuate the pain. Further, self-care recommendations should not be overlooked; these include optimistic counselling, reducing stimulation of the affected tissues, and modification of oral hygiene practices.

Prognosis

Results of empirically based treatment have varying responses, meaning some patients obtain significant pain relief while others obtain none. Long-term data, albeit limited, suggest that up to one-third of patients perceive considerable improvement, and 10% become pain free over a seven-year time frame (Pigg *et al*, 2013). Repeated dental procedures in the painful dento-alveolar area do not relieve the patient's pain, and such surgical interventions are associated with the continued persistence of this pain.

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